RESEARCH & TECHNOLOGY
TRANSPORTER

MARCH 2001

U. S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

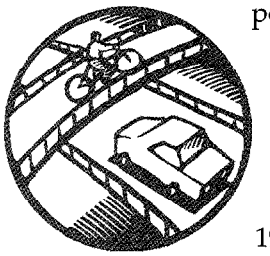
SAFETY

Making The Public Aware Of Work Zones

In a continuing effort to promote safety and mobility in work zones, the second annual National Work Zone Awareness Week will be held from April 9 to 12, 2001.

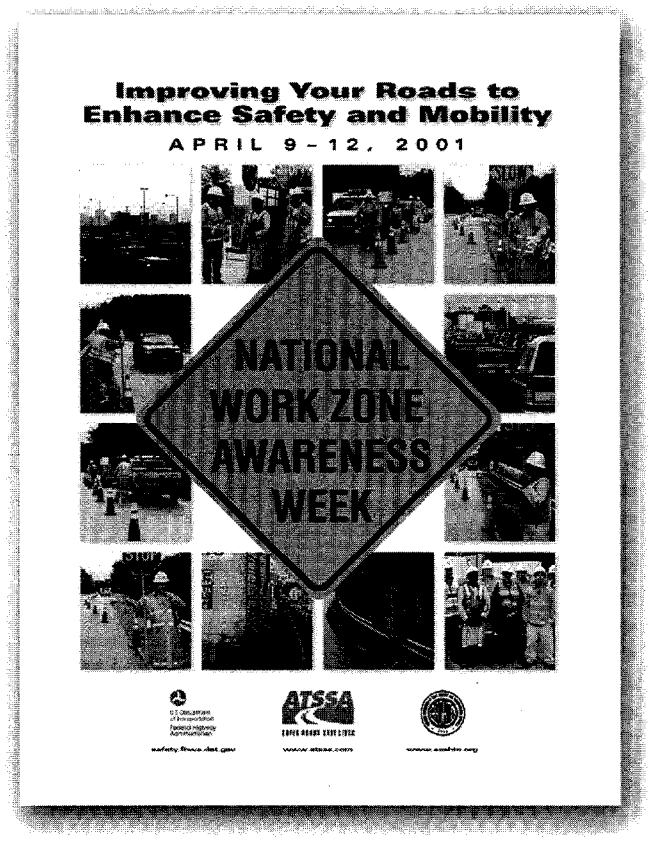
To kick off this campaign on April 9, the Federal Highway Administration (FHWA) and some of FHWA's highway partners will sponsor a media event on the National Mall in Washington, D.C., to draw attention to the large number of work zone-related fatalities, what FHWA and its partners are doing to make work zones safer, and what road users can do to ensure safe travel through a work zone.

The event on the Mall will include a memorial to the 868 people killed in work zones in 1999. A display of 868 highway cones, each draped with a black ribbon, will dramatically symbolize this preventable loss.



The first National Work Zone Awareness Week was held in April 2000. The special week was established by a memorandum of understanding (MOU) between the American Traffic Safety Services Association (ATSSA), the American Association of State Highway and Traffic Officials (AASHTO), and the Federal Highway Administration. The MOU created a partnership among states, industry, and the federal government to address work-zone problems; and since the signing ceremony, many other safety, enforcement, and engineering partners have become part of this effort.

In the past decade, nearly 9,000 people have lost their lives in work-zone crashes. A three-year decline in fatalities was reversed in 1998, when 772 people were killed and about 37,000 people were injured in work zones. The 868 deaths in 1999 are nearly 12.5 percent more than the previous year.



National Work Zone Awareness Week will kick-off in Washington, D.C., on April 9.

For further information on this campaign, please visit the National Work Zone Awareness Week Web site at *http://safety.fhwa.dot.gov* or contact:

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RESEARCH & TECHNOLOGY
TRANSPORTER

The *Research and Technology Transporter* communicates FHWA research, development, and technology accomplishments, findings, information, and technology transfer opportunities. Its audience is transportation engineers and professionals in State and local highway agencies, State DOTs, Local Technical Assistance Programs, Divisions, Resource Centers, Core Business Units, academia, and the research community. The eight-page newsletter is published monthly by FHWA's RD&T service business unit. Editorial offices are housed at the Turner-Fairbank Highway Research Center. Comments should be sent to the managing editor at the address below. Field offices are encouraged to submit articles for publication via the appropriate agency technology leader from the editorial board listed below. The newsletter can be viewed online at www.tfhrc.gov. Subscriptions to the *Transporter* are free. Send your request to Judy Dakin at the address below, or send email to judy.dakin@fhwa.dot.gov.

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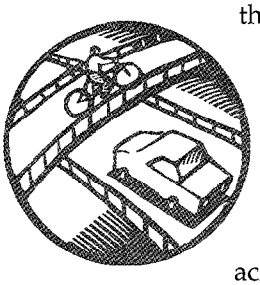
New Driving Simulator Makes Testing Efficient

The Human Centered Systems Team at TFHRC has acquired a part-task interactive driving simulator. It is a PC-based driving simulator developed by Systems Technology, Inc. In the past, the equipment costs and development times needed to support individual studies have been quite high for driver-in-the-loop simulators. For this reason, non-interactive simulators have sometimes been used for initial studies in the Human Centered Systems Laboratory. The acquisition of this new simulator makes it possible to develop low-cost interactive driving simulations. Driving scenarios can be completed in a matter of weeks by a single researcher with minimal assistance from a programmer or technician, thereby greatly enhancing the efficiency of the laboratory.



The new simulator will be used to research various highway safety issues, such as roadway design, driver behavior/performance, and pedestrian and bicycle safety. It will be used to research highway operations issues such as driver responses to navigation and other telematic information.

The first experiment planned for this new simulator will investigate the path and speed motorists select when navigating through various roundabout designs. The results from the study will aid roadway engineers in selecting an appropriate roundabout geometric design to achieve a given speed management objective.

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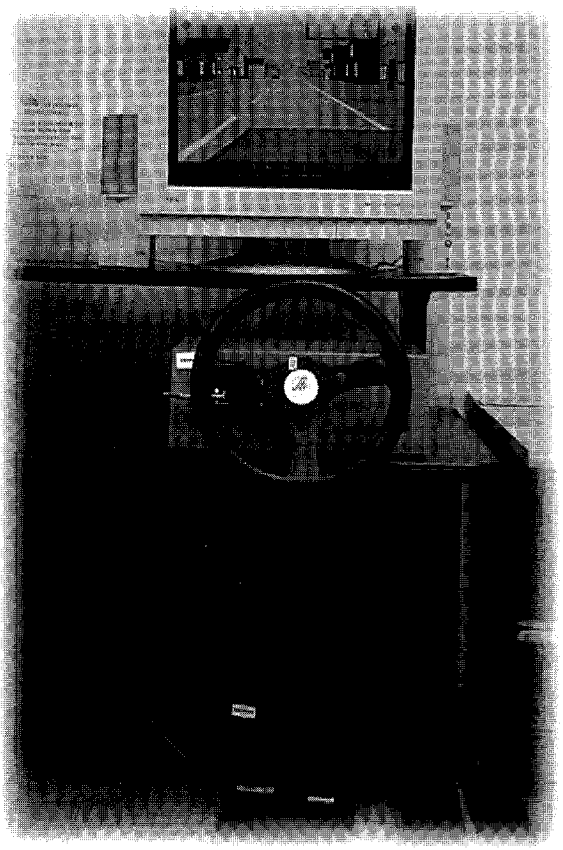

The new PC-based simulator makes it possible to develop interactive driving simulations at very little cost.

INFRASTRUCTURE

Mobile Concrete Lab: Bringing Technology Straight to Your Door

FHWA's Mobile Concrete Laboratory has been busy helping improve concrete quality in Indiana and Nebraska.

It can perform a wide range of both conventional and innovative nondestructive concrete tests. It can provide highway agency staff with hands-on experience in new technologies and test equipment. And it can come straight to your door. The FHWA Mobile Concrete Laboratory (MCL) is designed to introduce Federal, State, and local transportation personnel to state-of-the-art concrete technology for materials selection and mixture design, as well as field and laboratory testing. The current emphases for lab visits include assisting in implementing the use of high-performance concrete (HPC) for pavements and bridges, nondestructive testing, and performance-related specifications (PRS).

The fully equipped laboratory can be used to perform an extensive list of concrete tests, including such quality control tests as temperature, slump, air content, and unit weight measurements; elastic modulus; and strength testing. Nondestructive tests that can be carried out include maturity testing, tensile bond strength, impact echo, pulse velocity, and match curing. Available durability-related tests include rapid chloride permeability, surface airflow permeability, microwave water content, and alkali-silica reactivity detection.

The Nebraska Department of Roads recently used MCL's services for a plain concrete paving project. The Indiana Department of Transportation (INDOT) also received assistance from MCL recently at a PRS project on a section of Interstate 465. INDOT used the lab for both comparative and verification testing.

In addition to onsite visits, MCL has an equipment loan program where State highway personnel can borrow testing equipment for varying lengths of time after having been trained in its use by MCL staff. Lab personnel can also put on specialized workshops for States, provide speakers at workshops and conferences, and provide assistance over the phone or by e-mail. For more information on scheduling a visit to the lab or using the other services available, contact:

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TFHRC Evaluates Milwaukee's Damaged Hoan Bridge

The Turner-Fairbank Highway Research Center (TFHRC) is part of a forensic evaluation team evaluating the causes for brittle fractures that damaged the Hoan Bridge in Milwaukee, Wis.

On December 13, a 66-m section of the Hoan Bridge, which connects Milwaukee County's south side to the downtown metropolitan area, buckled after two of three support girders completely fractured and dropped the northbound lanes several feet. Oddly enough, the third girder, which was supporting the entire failing segment of the bridge after the fractures occurred, also was found to have a crack in the web. The bridge was inspected the week before the segment buckled, and at that time no problems were detected.

Because of concerns raised by the stability of the third girder and the fact that the Milwaukee Metropolitan Sewerage District was located below the damaged area of the bridge, officials decided to take down a 46-m section of the damaged bridge using explosives. Before the demolition occurred, TFHRC engineers inspected the fractures and documented their condition. In the aftermath, they also supervised the removal of wreckage underneath the bridge and then reconstructed the girders in a maintenance yard near Milwaukee's Mitchell International Airport.

All of the damaged portions of the bridge containing those fractures arrived at TFHRC on January 25. The girders will undergo evaluation in a variety of ways; the materials are undergoing extensive testing to determine their strength, toughness, and chemical composition; they will also undergo a fracture mechanics evaluation, including the development of a detailed analytical model that will be used to assist in determining the cause of failure. In addition, the Nondestructive Evaluation Validation Center (NDEVC) will be evaluating the girder sections and providing guidance on which inspection techniques are the most effective at identifying similar critical defects well in advance of their propagation to failure.

After demolition, the steel girders were extracted from the wreckage and sent to TFHRC for evaluation.

In addition to TFHRC, the forensic evaluation team is made up of Dr. John Fisher at Lehigh University, Lichtenstein Consulting Engineers, and Northwestern University.

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MOTOR CARRIERS

FMCSA Research & Technology Hosts Post-TRB Workshop

On the last day of the 80th annual Transportation Research Board (TRB) conference, FMCSA Office of Research and Technology (R&T) held, for the first time, a workshop to identify R&T needs in promoting truck and motor coach safety. Close to 200 participants convened at the Omni Shoreham Hotel to brainstorm R&T strategies for meeting FMCSA's goal of dramatically reducing the number of fatalities and injuries resulting from truck and motor coach crashes.

Federal transportation representatives joined with participants from a wide range of State governments, universities, safety advocacy groups, truck and bus associations, and technology and manufacturing companies. After an overview of the R&T program, workshop attendees split into breakout groups where they voiced their suggestions and concerns related to FMCSA R&T, and filled out written feedback forms. Examples of the wide range of participants' suggestions include:

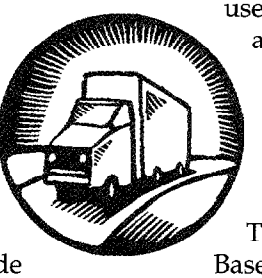
(Continued on page 5)

Ground *braking* Technology

Thanks to a Federal Motor Carrier Safety Administration (FMCSA) study, commercial motor vehicle inspectors will be able to identify weak and defective brakes more efficiently and accurately. In July 1998, FMCSA sponsored a series of round robin tests to assess the suitability of performance-based brake testers (PBBTs) for use in commercial motor vehicle inspections. The round robin tests, in which researchers from Battelle Memorial Institute used a single standard to evaluate several types of testers, are part of an ongoing effort to eliminate regulatory and research barriers to the implementation of PBBTs.

In the traditional assessment of truck and bus brakes, an inspector must crawl beneath a vehicle to conduct a hands-on visual inspection. PBBTs measure safe stopping capability without such an evaluation. Though PBBTs may not replace the sensory inspection process, they provide an additional tool for assessing brake performance.

FMCSA evaluated PBBTs in earlier field tests, then developed evaluation criteria based on those results. In the round robin tests, conducted at the National Highway Traffic Safety Administration's Vehicle Research and Test Center, researchers used two types of commercial motor vehicles and evaluated several PBBTs. The findings indicated that the accuracy and consistency of most PBBTs were sufficient to warrant their use in roadside inspection and enforcement.



Since the round robin tests, FMCSA has continued its research to support the use of PBBTs. In August 2000, FMCSA published PBBTs performance requirements and proposed pass/fail criteria for PBBTs used in commercial motor vehicle inspections. Simultaneous use of visual inspections and PBBTs will help drivers and inspectors more efficiently maintain safer commercial motor vehicles.

The report, Performance-Based Brake Testers—Round Robin Final Report, is available at *www.fmcsa.dot.gov/safetyprogs/brakesaft.htm.*

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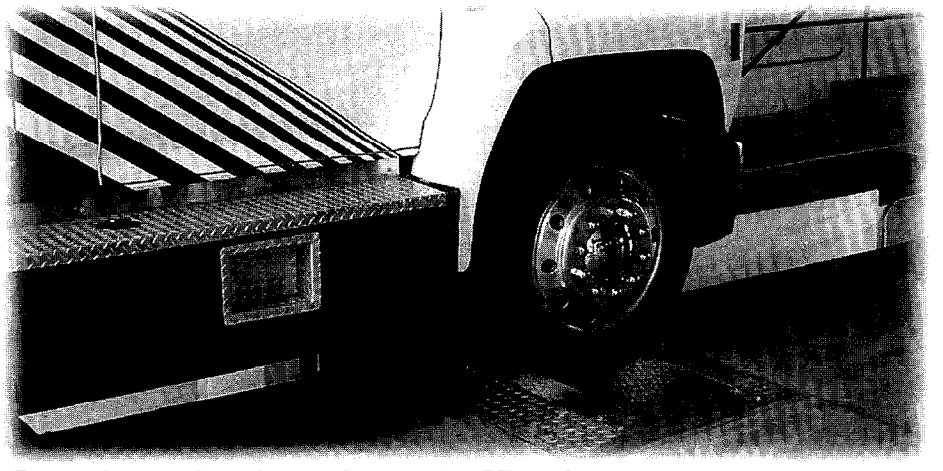

Researchers evaluated several types of PBBTs in the round robin study, including this in-ground roller dynamometer.

(Continued from page 4)

- Continue to focus on driver-related issues and acknowledge the good work of drivers,
- Improve the quality and organization of data and work with the insurance industry to utilize its resources,
- Further examine how the industrial process, including carriers and shippers, affects safety, and
- Ensure the benefits of proposed technology and education programs are validated through research.

The R&T program, under its new director, John MacGowan, is reviewing the feedback forms and discussion transcripts for inclusion in a comprehensive report to be available in April.

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Surfing the Web for OneDOT Information

Publications aren't just available on bookshelves, there are a wealth of transportation-related publications available online. Whether you're searching for an FHWA, U.S. DOT, or State DOT publication, chances are the information is available on one of the Web sites listed below. These are only a few of the user-friendly electronic databases that are available at everyone's fingertips. You can also check FHWA's main Web site (www.fhwa.dot.gov) and FHWA's research, development, and technology Web site (www.tfhrc.gov).

- *http://ntl.bts.gov/tris*—The Transportation Research Information Service (TRIS) database now has 500,000 records of published and on-going transportation research. It is (TRIS Online, Version 1.5) available to the public through the Bureau of Transportation Statistics National Transportation Library's Web site, and has abstracts of the research and some links to full-text documents.
- *http://ntl.bts.gov*—The National Transportation Library (NTL) has over 5,300 full-text documents and a search engine that indexes 110,000 documents from 14 transportation agencies. The NTL document collection includes U.S. DOT reports, transportation planning documents, and material from more than 30 State DOT's and university Web sites.
- *www.ntis.gov*—Even though the National Technical Information Service (NTIS) collection is large and varied, with nearly 3 million titles, you can easily browse through the collection for government-produced information from around the world. You can customize your searches to specific needs, and most items are available for purchase directly from NTIS. NTIS can also be reached at (703) 605-6000 or the toll-free number (800) 553-NTIS (6847) from 8 a.m. to 8 p.m. EST, Mon.–Fri.

U.S. DOT librarians tap into the RIDER information network during a library-training workshop held at TFHRC in October 2000.

- *http://isweb.tasc.dot.gov/Library/library.htm*—Through Research Information Databases and Electronic Resources (RIDER), the DOT Library offers hundreds of technical, scientific, legal, and business databases to DOT employees at their desktops. The system consists of three components: the DOT Online Catalog, Research and Reference Databases, and the Digital Special Collection.

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Public Roads Online Gets A New Look

The November/December 2000 issue of Public Roads Online (*http://www.tfhrc.gov/pubrds/pubrds.htm*) debuted a new Web design that makes access to important transportation related articles more user-friendly.

Public Roads has been available online through the Web site of TFHRC (www.tfhrc.gov) for several years. The online version contains all of the articles and departments of the printed version of the magazine. Unlike the printed version, however, Public Roads Online is always accessible if a computer is nearby. Potential authors at FHWA and State DOTs can realize greater exposure to the transportation community beyond traditional print distribution.

Public Roads has been published since May 1918. The magazine covers advances and innovations in highway/traffic research and technology, critical national transportation issues, important activities and achievements of FHWA and others in the highway community, specific FHWA program areas, and subjects of

(Continued on page 7)

(Continued from page 6)
interest to highway industry professionals. Each issue contains standard departments with information on topics of general interest, notices of recent publications in research and development and in technology applications. Other regular departments include internet-related information applicable to transportation professionals, programs and courses offered by the National Highway Institute, and a calendar of major conferences and special events. For more information on *Public Roads*, contact the editor, Bob Bryant [bob.bryant@fhwa.dot.gov, (202) 493-3191].

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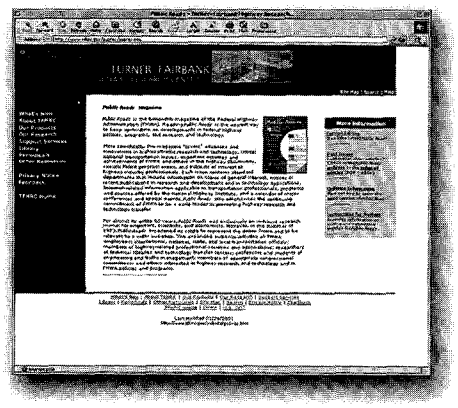

OPERATIONS

Portable TMC Makes Regatta A Success

Last year, the Puerto Rico Highway and Transportation Authority (PRHTA) developed an ITS project to manage traffic during a special regatta held for classic tall ships from all over the world. Carried out at a cost of $1.5 million, the ITS project was unique because it required creating a semi-portable transportation management center (TMC). TMC was equipped with computers, three video monitors, nine closed circuit TV cameras, 13 changeable message signs, closed loop traffic signals, highway advisory radio, a Web site providing trip information and live video images of traffic conditions, and one service patrol/towing truck.

The challenge facing PRHTA in creating TMC was how to provide access for more than 100,000 regatta visitors through just one artery that accesses the San Juan Port. The portable TMC met the challenge by coordinating all traffic without any congestion during the weeklong regatta. TMC was established at a fire station located near the port and was staffed by PRHTA traffic and operations personnel. They coordinated traffic operations with the police department and regatta staff who had personnel stationed at the TMC communicating via state-of-the-art communications equipment.

TMC was established at a fire station located near the port and was staffed by PRHTA traffic and operations personnel.

TMC provided continuous traffic monitoring and incident management before and during the regatta. From TMC, traffic signals were programmed according to traffic conditions; changeable message signs displayed appropriate messages regarding parking and route instructions; and the advisory radio provided traffic advice, event itinerary, and public transportation updates. During peak travel hours, reversible lanes were marked using innovative delineated devices made of PVC tubing and retroreflective sheathing. Incidents, disabled vehicles, and illegal parking were detected by TMC and removed by the service patrol/towing truck in coordination with the local police.

The regatta was a huge success: visitors got to and from the event, and there were no delays or congestion. PRHTA staff showed that by using an ITS architecture, traffic can sail smoothly.

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HRTS

PROFESSIONAL DEVELOPMENT

National Transportation Week Held May 13–19

Last year, National Transportation Week (NTW) was celebrated with over 80 events held across the nation. School children, industry leaders, and transportation professionals joined together to not only celebrate the accomplishments of transportation, but to focus on our future challenges and opportunities. By all accounts, NTW 2000 was a huge success, and NTW 2001, which will be held May 13–19, promises to be even bigger.

For almost 40 years, NTW has focused attention on the importance and benefits of transportation. NTW educates the public about the transportation industry and encourages young people to pursue careers in transportation. In recent years, support and interest for this week has grown throughout the transportation community. NTW 2000's program included a kick-off event at the National Press Club with then Secretary of Transportation Rodney Slater and former Secretaries Coleman, Boyd, and Skinner, as well as a poster contest for 5th graders, which drew over 150 entries.

This year's program will be kicked off with a rally on March 15 to generate support for NTW and finalize May's events. Representatives from more than 20 transportation organizations will come together to coordinate plans. Other programs planned include a major event on Capitol Hill; a National Press Club event; a broad outreach to schools; and an update of the toolkit, which will outline how organizations publicize NTW on a local level. To become involved, you and your organization can:

- Visit a high school during NTW and talk about careers in transportation;
- Help organize an elementary school's participation in the poster contest;
- Organize a civic function recognizing NTW and transportation's role within your community;
- Become part of, or start, an NTW program in your own State with other transportation professionals such as yourself; and
- Include NTW 2001 dates on your Web site.

"NTW offers a great opportunity for virtually everyone in transportation to be a part of this celebration," said David Winstead, NTW 2001 honorary chairman. "My hope is that people working in all the modes, in the public and private sectors, can all come together during this week to show our best to the American public."

For more information on NTW visit www.ntweek.org or call the toll-free phone number at (877) 558-6874.

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